

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 14, 2014

Prepared by
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Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 14, 2014 07:00 to December 15, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), hydrochloric acid (HCl), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. An additional unit was deployed in conjunction with work operations near frac tanks as recommended by the onsite safety officer. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S , and SO_2 . Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were collocated with AreaRAE stations 1, 2, 3 and 4 and data-logged to monitor PM_{10} . Table 3 summarizes data-logged particulate monitoring data.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
December 14, 2014 07:00 – December 15, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Community	Cl ₂	Gastec 8La	6	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	31	0	NA	<1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	30	0	NA	<1 %
	O ₂	MR+ / MR Pro	30	30	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	30	30	0.006	0.003 - 0.009 mg/m ³
	SO ₂	MR+ / MR Pro	29	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	6	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	30	0	NA	<0.1 ppm
Work Area	Benzene	UltraRAE	2	0	NA	<0.05 ppm
	Cl ₂	Gastec 8La	1	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	31	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	30	0	NA	<1 %
	O ₂	MR+ / MR Pro	24	24	20.9	20.9 - 20.9 %
	SO ₂	MR+ / MR Pro	18	0	NA	<0.1 ppm
	VOC	MR+ / MR Pro	32	3	0.233	0.1 - 0.4 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
December 14, 2014 07:00 – December 15, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Community	Cl ₂	Gastec 8La	6	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	31	0	NA	<1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	30	0	NA	<1 %
	O ₂	MR+ / MR Pro	30	30	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	30	30	0.006	0.003 - 0.009 mg/m ³
	SO ₂	MR+ / MR Pro	29	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	6	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	30	0	NA	<0.1 ppm
Work Area	Benzene	UltraRAE	2	0	NA	<0.05 ppm
	Cl ₂	Gastec 8La	1	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	31	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	30	0	NA	<1 %
	O ₂	MR+ / MR Pro	24	24	20.9	20.9 - 20.9 %
	SO ₂	MR+ / MR Pro	18	0	NA	<0.1 ppm
	VOC	MR+ / MR Pro	32	3	0.233	0.1 - 0.4 ppm

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²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary¹
December 14, 2014 07:00 – December 15, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Unit 01	H ₂ S	5665	99	0.1 ppm	0.1 - 0.2 ppm
	LEL	5665	0	NA	< 1 %
	SO ₂	5665	0	NA	< 0.1 ppm
	VOC	5665	0	NA	< 0.1 ppm
Unit 02	H ₂ S	5677	189	0.1 ppm	0.1 - 0.1 ppm
	LEL	5677	0	NA	< 1 %
	SO ₂	5677	0	NA	< 0.1 ppm
	VOC	5677	61	0.3 ppm	0.1 - 1.2 ppm
Unit 03	H ₂ S	5654	0	NA	< 0.1 ppm
	LEL	5654	0	NA	< 1 %
	SO ₂	5654	0	NA	< 0.1 ppm
	VOC	5654	298	0.2 ppm	0.1 - 0.8 ppm
Unit 04	H ₂ S	5268	68	0.1 ppm	0.1 - 0.1 ppm
	LEL	5268	0	NA	< 1 %
	SO ₂	5268	0	NA	< 0.1 ppm
	VOC	5268	1	0.1 ppm	0.1 - 0.1 ppm
Unit 06	H ₂ S	1871	32	0.1 ppm	0.1 - 0.1 ppm
	LEL	1871	0	NA	< 1 %
	SO ₂	1871	0	NA	< 0.1 ppm
	VOC	1871	763	0.5 ppm	0.1 - 2.5 ppm

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²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 3: AM510 PM₁₀ Monitoring Summary¹
December 14, 2014 07:00 – December 15, 2014 07:00

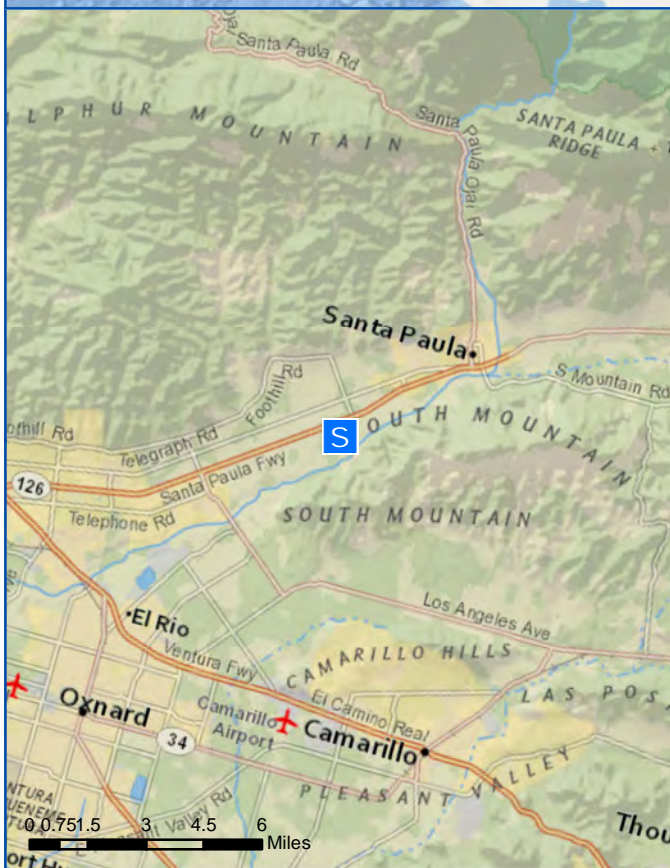
Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10601072	AR01	5353	5353	0.008	0.002 - 0.136 mg/m ³
10408087	AR02	5224	5090	0.011	0.001 - 0.643 mg/m ³
10704074	AR03	5314	5314	0.01	0.003 - 0.362 mg/m ³
10704072	AR04	4795	4794	0.006	0.001 - 0.06 mg/m ³

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Appendix A

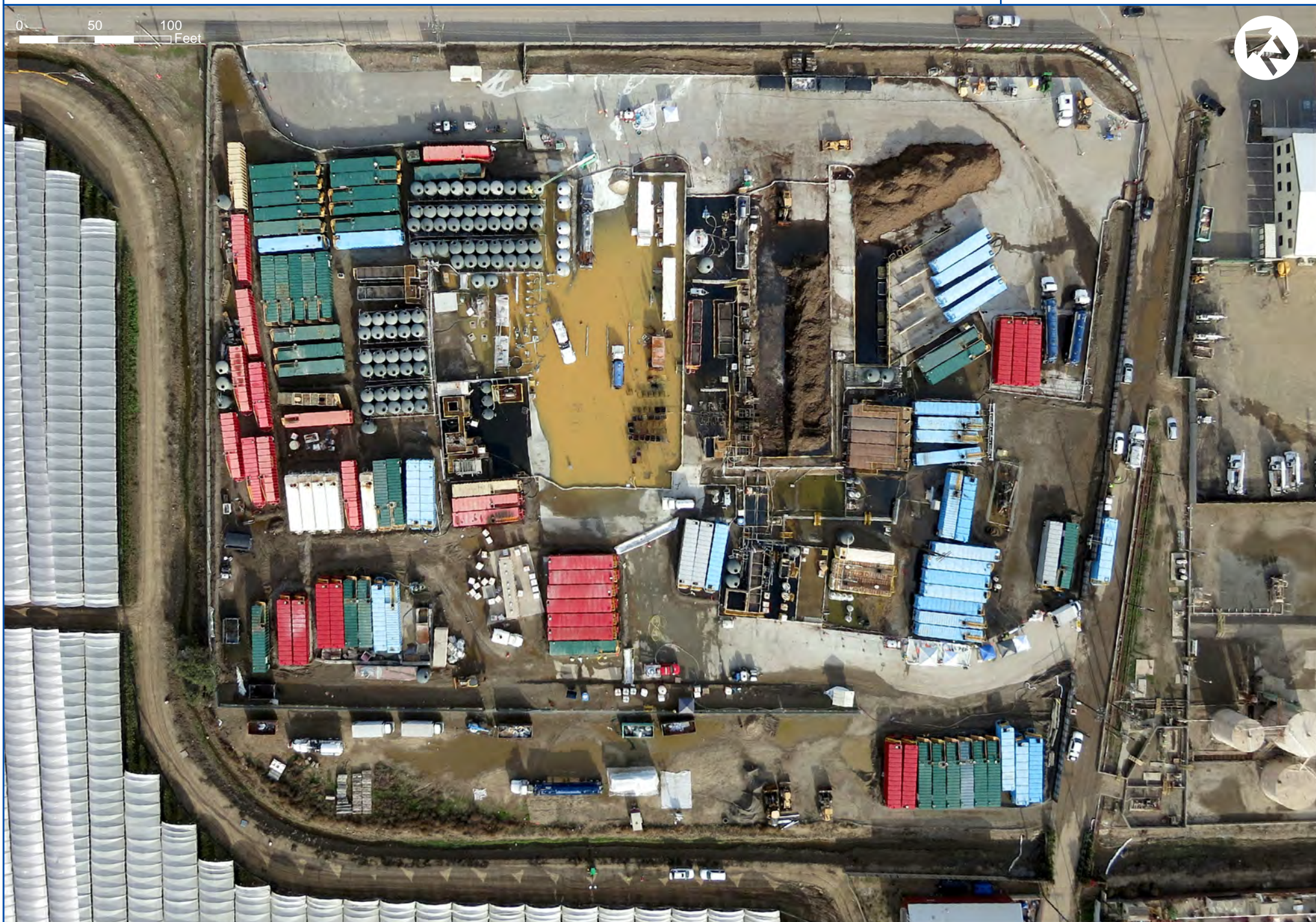
Incident Maps:

Real-time Air Monitoring Locations and Incident Site



Legend

 Site Location



0 250 500 1,000
Feet



Legend

- FRT Location
- Site Location





Legend

Monitoring Location

- Non-detect (< 0.2 mg/m³)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Detect (0.003 - 0.009 mg/m³)
- S Incident Site

0 0.125 0.25 0.5 Miles





Legend

Monitoring Location

- Detect (20.9 %)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 1 %)
- S Incident Site

0 0.125 0.25 0.5 Miles





Legend

Monitoring Location

- Non-detect (< 1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Non-detect (< 0.05 ppm)
- S Incident Site

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map

0 50 100 Feet



AR01



AR02

AR04

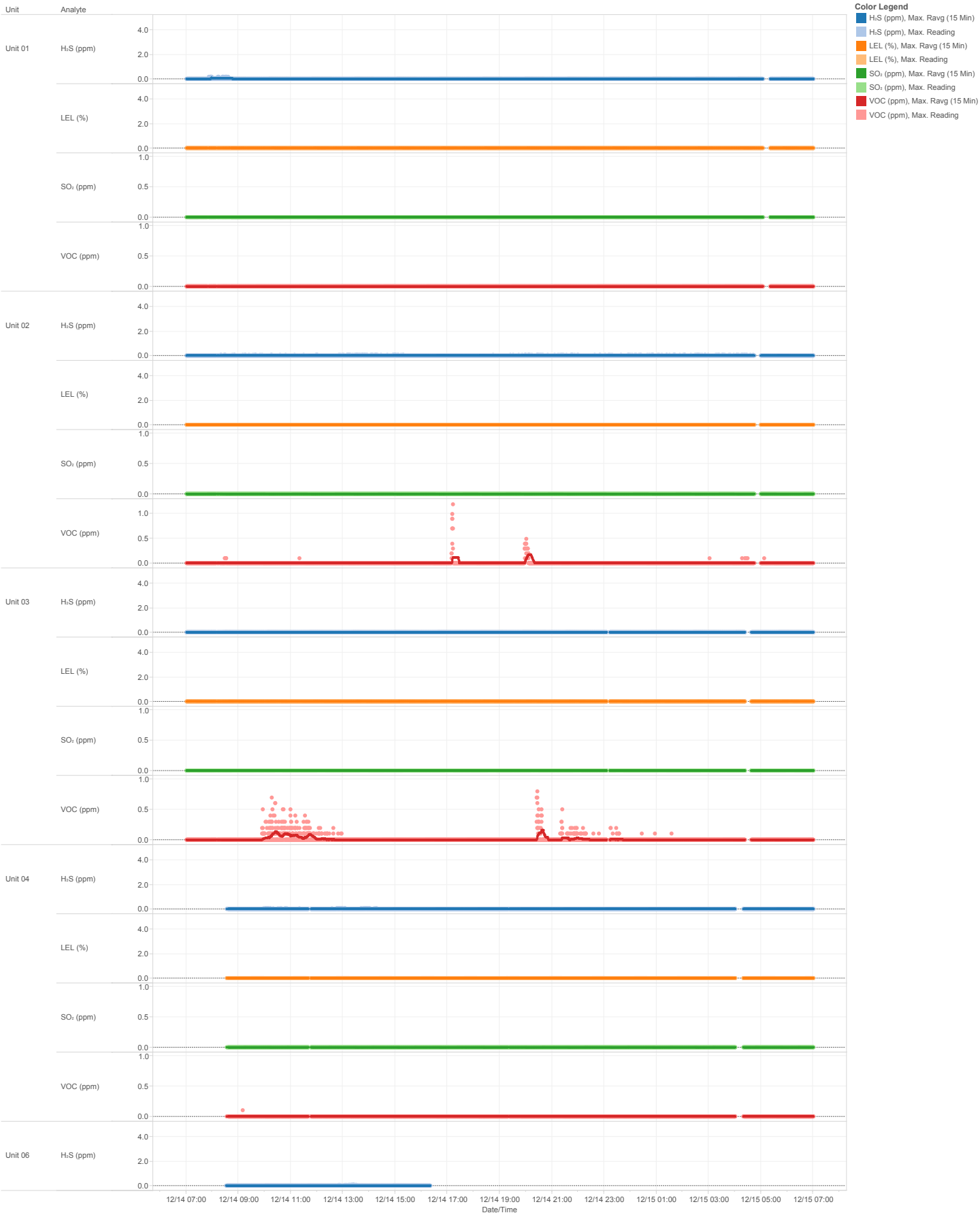
AR06

AR03

Legend

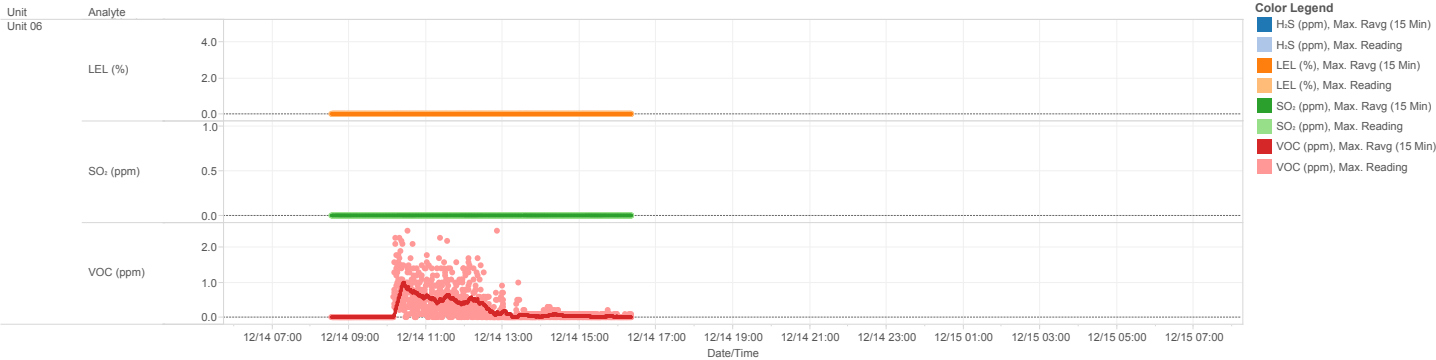
-  AreaRAE & AM510 Station
-  AreaRAE Station

Patriot Environmental
AreaRAE Trend Graphs
12/14/2014 07:00 - 12/15/2014 07:00



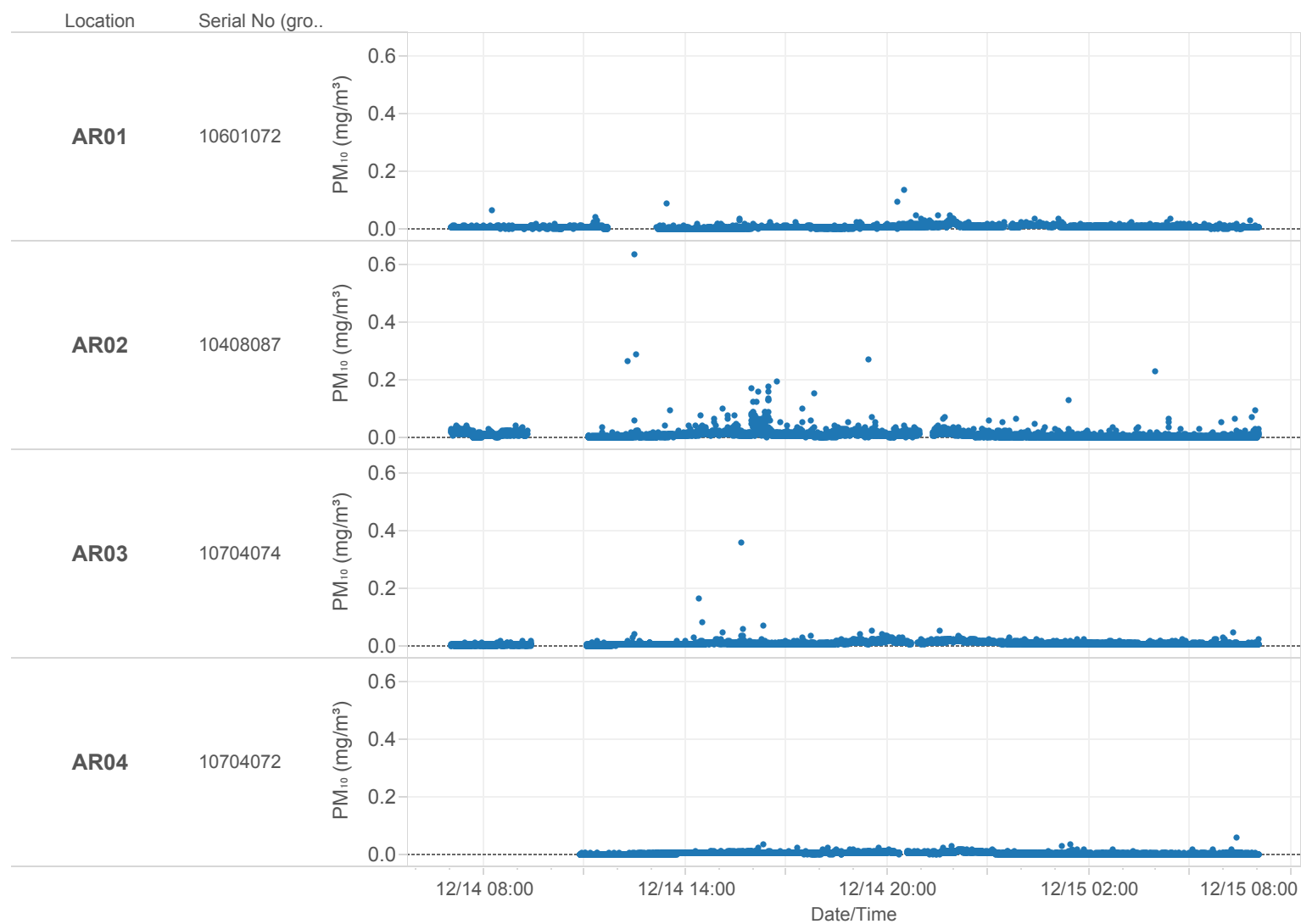
- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
12/14/2014 07:00 - 12/15/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM₁₀) Summary
12/14/2014 07:00 - 12/15/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format